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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,850	11/26/2002	Christian Maria Anton Heller	122023	3372

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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NISKAYUNA, NY 12309

EXAMINER	
FICK, ANTHONY D	
ART UNIT	**PAPER NUMBER**
1753	

DATE MAILED: 11/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/065,850	HELLER, CHRISTIAN MARIA ANTON	
	Examiner	Art Unit	
	Anthony Fick	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) *8-11,19-21,28-36 and 38-50* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,12-18,22-27 and 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-50* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of organic electroluminescent devices as the species for prosecution in the reply filed on July 18, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 35 and 39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on July 18, 2006.

Remarks

3. Applicant's amendments to the abstract have overcome the previous objection. Applicant's amendments to the claims have overcome the rejections under 35 U.S.C. 112 second paragraph. The rejections are accordingly withdrawn.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 through 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Shiotsuka et al (U.S Patent Application Publication 2003/0005955).

Shiotsuka et al discloses a compound electrode comprising a first layer of a first electrically conducting material (104) made from a variety of materials including In, Sn, and Zn, and a plurality of elongated members (105a, 105b) in electrical contact with said first layer, said elongated members (105a, 105b) comprising a second electrically conductive material (see Figures 1A and 1B; and paragraphs 0060 to 0066). Layer (104) is, for example, 70 nm in thickness (see paragraph 0100), and, as seen in Figure 1B and paragraph 0104, said elongated members are much thicker than this. The elongated members (105a, 105b) intersect as in instant claim 3 (see Figure 1A). Since Shiotsuka et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

6. Claims 1, 12, 14, 22, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 10-255982 (herein referred to as JP '982).

JP '982 teaches an organic electroluminescent element containing two of the instant compound electrodes, wherein one of JP '982's compound electrodes comprises layer (12) made of materials including Sn and In, which reads on the instant first layer, and adjacent layer (20), which reads on the instant plurality of elongated members and can be in the form of stripes or a mesh (see Figure 1; and paragraphs 0009 to 0015). Since JP '982 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

7. Claims 1, 2, 12, 13, 22, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuri et al (U.S. Patent 6,949,878).

Suzuri et al teaches an organic EL element having the instant compound electrode, wherein the compound electrode comprises cathode buffer layer (electron injecting layer) (26), which reads on the instant first electrically conducting material and is made from, for example, a metal or LiF, and, in electrical contact with said layer (26) is a plurality of elongated members (27) (see Figure 7; col. 8, lines 54-62; col. 30, lines 60-66). The layer (26) has a thickness of, for example 0.5 nm, whereas the plurality of elongated members (27) each has a thickness of 200 nm (see col. 30, lines 60-66). Since Suzuri et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka et al (U.S Patent Application Publication 2003/0005955).

Shiotsuka et al teaches a compound electrode comprising a first layer of a first electrically conducting material (104) made from a variety of materials including In, Sn, and Zn, and a plurality of elongated members (105a, 105b) in electrical contact with said first layer, said elongated members (105a, 105b) comprising a second electrically

conductive material (see Figures 1A and 1B; and paragraphs 0060 to 0066). Layer (104) is, for example, 70 nm in thickness (see paragraph 0100), and, as seen in Figure 1B and paragraph 0104, said elongated members are much thicker than this. The elongated members (105a, 105b) intersect as in instant claim 3 (see Figure 1A). Shiotsuka et al teaches the limitations of the instant claims, other than the difference which is discussed below.

With respect to claims 4-6, Shiotsuka et al does not specifically teach the total surface area of its plurality of elongated members (105a, 105b) with respect to the total surface area of said layer (104). However, Shiotsuka et al prepares a photovoltaic device, and said plurality of elongated members (105a, 105b) is on the light receiving side of the device (see paragraphs 0002, 0017, 0054, and 0060 to 0066). In the absence of anything unexpected, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Shiotsuka et al's photovoltaic device such that the plurality of elongated members (105a, 105b) are as narrow as possible so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the cell. The preparation of Shiotsuka et al's photovoltaic device such that said plurality of elongated members (105a, 105b) have a surface area that is less than 50%, or less than 25%, or less than 10% of the surface area of the layer (104) would have been within the level of ordinary skill in the art so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the photovoltaic device.

With respect to claim 7, when an area of short circuit is present in said layer (104), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because Shiotsuka et al's compound electrode has the same structure as the instant compound electrode.

10. Claims 1-7 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka et al (U.S Patent Application Publication 2003/0005955) in view of Sariciftci et al (U.S. Patent 5,331,183).

Shiotsuka et al teaches a compound electrode comprising a first layer of a first electrically conducting material (104) made from a variety of materials including In, Sn, and Zn, and a plurality of elongated members (105a, 105b) in electrical contact with said first layer, said elongated members (105a, 105b) comprising a second electrically conductive material (see Figures 1A and 1B; and paragraphs 0060 to 0066). Layer (104) is, for example, 70 nm (see paragraph 0100), and, as seen in Figure 1B and paragraph 0104, said elongated members are much thicker than this. The elongated members (105a, 105b) intersect as in instant claim 3 (see Figure 1A). Shiotsuka et al teaches the limitations of the instant claims, other than the differences which are discussed below.

With respect to claim 12 and its dependent claims, Shiotsuka et al does not specifically teach that its photoelectric conversion layer (103) comprises and electron donating organic semiconductor material and an electron accepting organic semiconducting material. Shiotsuka et al does teach a pn junction, a pin junction, a Schottky junction, or the like, and exemplifies semiconductors such as a-Si and a-SiGe,

but Shiotsuka is not limited to these semiconductors (see paragraphs 0057 and 0058). The use of two organic semiconducting materials to for a heterojunction for the photoelectric conversion layer is known in the art, as evidenced by Sariciftci et al. Sariciftci et al uses conjugated polymer and fullerene to form a pn heterojunction (see col. 1, lines 7-12; and col. 2, lines 19-29). The advantage of using organic materials is cost saving, the production of robust, large devices, and the matching of the absorption spectrum of the conjugated polymer to the solar spectrum (see the paragraph bridging cols. 1 and 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used Sariciftci et al's conjugated polymer and fullerene to form the pn junction in Shiotsuka et al's photovoltaic device because the use of such organic materials to prepare the pn junction of a photovoltaic device provides the advantage of cost saving, the production of robust, large devices, and the matching of the absorption spectrum of the conjugated polymer to the solar spectrum, as taught by Sariciftci et al.

With respect to claims 4-6 and 15-17, Shiotsuka et al does not specifically teach the total surface area of its plurality of elongated members (105a, 105b) with respect to the total surface area of said layer (104). However, Shiotsuka et al prepares a photovoltaic device, and said plurality of elongated members (105a, 105b) is on the light receiving side of the device (see paragraphs 0002, 0017, 0054, and 0060 to 0066). In the absence of anything unexpected, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Shiotsuka et al's photovoltaic device such that the plurality of elongated members (105a, 105b) are as

narrow as possible so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the cell. The preparation of Shiotsuka et al's photovoltaic device such that said plurality of elongated members (105a, 105b) have a surface area that less than 50%, or less than 25%, or less than 10% of the surface area of the layer (104) would have been within the level of ordinary skill in the art so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the photovoltaic device.

With respect to claims 7 and 18, when an area of short circuit is present in said layer (104), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because Shiotsuka et al's compound electrode has the same structure as the instant compound electrode.

11. Claims 1, 12, 14-18, 22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-255982 (herein referred to as JP '982).

JP '982 teaches an organic electroluminescent element containing two of the instant compound electrodes, wherein one of JP '982's compound electrodes comprises layer (12) made of materials including Sn and In, which reads on the instant first layer, and adjacent layer (20), which reads on the instant plurality of elongated members and can be in the form of stripes or a mesh (see Figure 1; and paragraphs 0009 to 0015). JP '982 teaches the limitations of the instant claims, other than the difference which is discussed below.

With respect to claims 15-17, JP '982 does not specifically teach the total surface area of its plurality of elongated members (20) with respect to the total surface area of either said layer (12) or said layer (16). However, JP '982 is not limited to any particular width for its members (20). The use of a width of the members (20) such that the members (20) have a surface area that is less than 50%, or less than 25%, or less than 10% of the surface area of the layer (12) or (16) would have been within the level of ordinary skill in the art so as to prepare a working organic electroluminescent device.

With respect to claim 18, when an area of short circuit is present in said layer (12) or (16), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because JP '982's compound electrodes have the same structure as the instant compound electrode.

12. Claims 1-7, 12-18, 22-27, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuri et al (U.S. Patent 6,949,878).

Suzuri et al teaches an organic EL element having the instant compound electrode, wherein the compound electrode comprises cathode buffer layer (electron injecting layer) (26), which reads on the instant first electrically conducting material and is made from, for example, a metal such as Sr or Al, or from LiF, and, in electrical contact with said layer (26) is a plurality of elongated members (27) made from Al (see Figure 7; col. 8, lines 54-62; col. 30, lines 60-66). The layer (26) has a thickness of, for example 0.5 nm, whereas the plurality of elongated members (27) each has a thickness

of 200 nm (see col. 30, lines 60-66). Suzuri et al teaches the limitations of the instant claims, other than the differences which are discussed below.

With respect to claims 3 and 14, Suzuri et al do not specifically teach that its elongated members (27) intersect. The elongated members (27) are part of the cathode for the device (see col. 30, line 65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used intersecting lines, i.e., a mesh, rather than parallel lines for the cathode in Suzuri et al's device because such would have been a matter of design choice. A skilled artisan would expect the device to function properly whether parallel lines or intersecting lines, such a mesh, are used for the cathode.

With respect to claims 4-6 and 15-17, Suzuri et al does not specifically teach the total surface area of its elongated members (27) with respect to the total surface area of said layer (26). However, Suzuri et al is not limited to any particular length and width for its members (27). The use of a length and width of the members (27) such that the members (27) have a surface area that is less than 50%, or less than 25%, or less than 10% of the surface area of the layer (26) would have been within the level of ordinary skill in the art so as to prepare a working organic EL element.

With respect to claims 7 and 18, when an area of short circuit is present in said layer (26), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because Suzuri et al's compound electrodes have the same structure as the instant compound electrode.

With respect to claims 23-25 and 27, Suzuri et al, as noted above, teaches that the layer (26) has a thickness of, for example 0.5 nm, whereas the plurality of elongated members (27) each has a thickness of 200 nm (see col. 30, lines 60-66). The layer (26) can, in general, have a thickness of 0.1 to 100 nm (see col. 8, lines 63-65). Suzuri et al does not specifically require that said layer (26) has a thickness of about 1 to about 25 nm as in said claims 23-25 and 27. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Suzuri et al's organic EL element such that the layer (26) has a thickness with the range of about 1 to about 25 nm because Suzuri et al exemplifies a thickness of 0.5 nm and teaches, in general, that the thickness can be from 0.1 to 100 nm.

With respect to claim 37, Suzuri et al does not specifically require a plurality of its organic EL elements disposed on a support. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared a device with a plurality of Suzuri et al's organic EL elements on a support so that a desired pattern or display could be obtained.

13. The preceding rejections are all made on a specific interpretation of the amended claims. It is the position of the examiner that an interpretation of the amended claims allows for other elements to be present within the first layer of electrically conducting material, i.e. oxygen, fluorine or other halides. The prior art shows first layers containing elements of applicant's Markush group within the claims along with these extra elements (oxygen, fluorine, etc.) thus meeting this interpretation of the claims. An alternate interpretation is the claims require only the elements listed within the claims to

be present within the first layer. Therefore the presence of any oxide, fluoride or other compound within the layer would not be the device claimed in the present invention. The following rejections are made on the basis of this interpretation of the claims.

14. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka et al (U.S Patent Application Publication 2003/0005955) in view of Suzuri et al. (U.S. 6,949,878).

Shiotsuka et al teaches a compound electrode comprising a first layer of a first electrically conducting material (104) made from a variety of materials including In, Sn, and Zn, and a plurality of elongated members (105a, 105b) in electrical contact with said first layer, said elongated members (105a, 105b) comprising a second electrically conductive material (see Figures 1A and 1B; and paragraphs 0060 to 0066). Layer (104) is, for example, 70 nm in thickness (see paragraph 0100), and, as seen in Figure 1B and paragraph 0104, said elongated members are much thicker than this. The elongated members (105a, 105b) intersect as in instant claim 3 (see Figure 1A). Shiotsuka et al teaches the limitations of the instant claims, other than the difference which is discussed below.

With respect to claim 1, Shiotsuka does not specifically teach using only the elements listed within the claim in the first layer of electrically conducting material.

Suzuri teaches a variety of electrically conductive materials that can be used within an electrode. The materials include sodium, sodium-potassium alloy, magnesium, lithium, magnesium/silver mixture, magnesium/indium mixture, indium, and aluminum oxide (column 8, paragraph 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the materials of Suzuri as the electrical conducting material within the device of Shiotsuka because the materials are functional equivalents to the conducting material of Shiotsuka. Because Suzuri and Shiotsuka are concerned with optoelectronic devices, one would have a reasonable expectation of success from the combination. Thus the combination meets claims 1 through 3.

With respect to claims 4-6, Shiotsuka et al does not specifically teach the total surface area of its plurality of elongated members (105a, 105b) with respect to the total surface area of said layer (104). However, Shiotsuka et al prepares a photovoltaic device, and said plurality of elongated members (105a, 105b) is on the light receiving side of the device (see paragraphs 0002, 0017, 0054, and 0060 to 0066). In the absence of anything unexpected, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Shiotsuka et al's photovoltaic device such that the plurality of elongated members (105a, 105b) are as narrow as possible so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the cell. The preparation of Shiotsuka et al's photovoltaic device such that said plurality of elongated members (105a, 105b) have a surface area that is less than 50%, or less than 25%, or less than 10% of the surface area of the layer (104) would have been within the level of ordinary skill in the art so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the photovoltaic device.

With respect to claim 7, when an area of short circuit is present in said layer (104), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because Shiotsuka et al's compound electrode has the same structure as the instant compound electrode.

15. Claims 1-7 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiotsuka et al (U.S Patent Application Publication 2003/0005955) in view of Sariciftci et al (U.S. Patent 5,331,183) and Suzuri et al. (U.S. 6,949,878).

Shiotsuka et al teaches a compound electrode comprising a first layer of a first electrically conducting material (104) made from a variety of materials including In, Sn, and Zn, and a plurality of elongated members (105a, 105b) in electrical contact with said first layer, said elongated members (105a, 105b) comprising a second electrically conductive material (see Figures 1A and 1B; and paragraphs 0060 to 0066). Layer (104) is, for example, 70 nm (see paragraph 0100), and, as seen in Figure 1B and paragraph 0104, said elongated members are much thicker than this. The elongated members (105a, 105b) intersect as in instant claim 3 (see Figure 1A). Shiotsuka et al teaches the limitations of the instant claims, other than the differences which are discussed below.

With respect to claim 12 and its dependent claims, Shiotsuka et al does not specifically teach that its photoelectric conversion layer (103) comprises and electron donating organic semiconductor material and an electron accepting organic semiconducting material. Shiotsuka et al does teach a pn junction, a pin junction, a Schottky junction, or the like, and exemplifies semiconductors such as a-Si and a-SiGe,

but Shiotsuka is not limited to these semiconductors (see paragraphs 0057 and 0058). The use of two organic semiconducting materials to for a heterojunction for the photoelectric conversion layer is known in the art, as evidenced by Sariciftci et al. Sariciftci et al uses conjugated polymer and fullerene to form a pn heterojunction (see col. 1, lines 7-12; and col. 2, lines 19-29). The advantage of using organic materials is cost saving, the production of robust, large devices, and the matching of the absorption spectrum of the conjugated polymer to the solar spectrum (see the paragraph bridging cols. 1 and 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used Sariciftci et al's conjugated polymer and fullerene to form the pn junction in Shiotsuka et al's photovoltaic device because the use of such organic materials to prepare the pn junction of a photovoltaic device provides the advantage of cost saving, the production of robust, large devices, and the matching of the absorption spectrum of the conjugated polymer to the solar spectrum, as taught by Sariciftci et al.

With further respect to claim 12, Shiotsuka does not specifically teach using only the elements listed within the claim in the first layer of electrically conducting material.

Suzuri teaches a variety of electrically conductive materials that can be used within an electrode. The materials include sodium, sodium-potassium alloy, magnesium, lithium, magnesium/silver mixture, magnesium/indium mixture, indium, and aluminum oxide (column 8, paragraph 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the materials of Suzuri as the electrical conducting

material within the device of Shiotsuka because the materials are functional equivalents to the conducting material of Shiotsuka. Because Suzuri and Shiotsuka are concerned with optoelectronic devices, one would have a reasonable expectation of success from the combination.

With respect to claims 4-6 and 15-17, Shiotsuka et al does not specifically teach the total surface area of its plurality of elongated members (105a, 105b) with respect to the total surface area of said layer (104). However, Shiotsuka et al prepares a photovoltaic device, and said plurality of elongated members (105a, 105b) is on the light receiving side of the device (see paragraphs 0002, 0017, 0054, and 0060 to 0066). In the absence of anything unexpected, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Shiotsuka et al's photovoltaic device such that the plurality of elongated members (105a, 105b) are as narrow as possible so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the cell. The preparation of Shiotsuka et al's photovoltaic device such that said plurality of elongated members (105a, 105b) have a surface area that less than 50%, or less than 25%, or less than 10% of the surface area of the layer (104) would have been within the level of ordinary skill in the art so as to permit as much light as possible to strike the photoelectric conversion layer (103) of the photovoltaic device.

With respect to claims 7 and 18, when an area of short circuit is present in said layer (104), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because

Shiotsuka et al's compound electrode has the same structure as the instant compound electrode.

16. Claims 1, 12, 14-18, 22, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-255982 (herein referred to as JP '982) in view of Suzuri et al. (U.S. 6,949,878).

JP '982 teaches an organic electroluminescent element containing two of the instant compound electrodes, wherein one of JP '982's compound electrodes comprises layer (12) made of materials including Sn and In, which reads on the instant first layer, and adjacent layer (20), which reads on the instant plurality of elongated members and can be in the form of stripes or a mesh (see Figure 1; and paragraphs 0009 to 0015). JP '982 teaches the limitations of the instant claims, other than the difference which is discussed below.

With respect to claims 1 and 12, JP '982 does not specifically teach using only the elements listed within the claim in the first layer of electrically conducting material.

Suzuri teaches a variety of electrically conductive materials that can be used within an electrode. The materials include sodium, sodium-potassium alloy, magnesium, lithium, magnesium/silver mixture, magnesium/indium mixture, indium, and aluminum oxide (column 8, paragraph 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the materials of Suzuri as the electrical conducting material within the device of JP '982 because the materials are functional equivalents to the conducting material of JP '982. Because Suzuri and JP '982 are concerned with

optoelectronic devices, one would have a reasonable expectation of success from the combination.

With respect to claims 15-17, JP '982 does not specifically teach the total surface area of its plurality of elongated members (20) with respect to the total surface area of either said layer (12) or said layer (16). However, JP '982 is not limited to any particular width for its members (20). The use of a width of the members (20) such that the members (20) have a surface area that is less than 50%, or less than 25%, or less than 10% of the surface area of the layer (12) or (16) would have been within the level of ordinary skill in the art so as to prepare a working organic electroluminescent device.

With respect to claim 18, when an area of short circuit is present in said layer (12) or (16), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because JP '982's compound electrodes have the same structure as the instant compound electrode.

17. Claims 1-7, 12-18, 22-27, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuri et al (U.S. Patent 6,949,878).

Suzuri et al teaches an organic EL element having the instant compound electrode, wherein the compound electrode comprises cathode buffer layer (electron injecting layer) (26), which reads on the instant first electrically conducting material and is made from, for example, a metal such as Sr or Al, or from LiF, and, in electrical contact with said layer (26) is a plurality of elongated members (27) made from Al (see Figure 7; col. 8, lines 54-62; col. 30, lines 60-66). The layer (26) has a thickness of, for

example 0.5 nm, whereas the plurality of elongated members (27) each has a thickness of 200 nm (see col. 30, lines 60-66). Suzuri et al teaches the limitations of the instant claims, other than the differences which are discussed below.

With respect to claims 1, 12 and 37, Suzuri does not specifically teach using only the elements listed within the claim in the first layer of electrically conducting material.

Suzuri does teach a variety of electrically conductive materials that can be used within an electrode. The materials include sodium, sodium-potassium alloy, magnesium, lithium, magnesium/silver mixture, magnesium/indium mixture, indium, and aluminum oxide (column 8, paragraph 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the materials of Suzuri as the electrical conducting material in the cathode buffer layer because the materials are functional equivalents to the buffer layer material.

With respect to claims 3 and 14, Suzuri et al do not specifically teach that its elongated members (27) intersect. The elongated members (27) are part of the cathode for the device (see col. 30, line 65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used intersecting lines, i.e., a mesh, rather than parallel lines for the cathode in Suzuri et al's device because such would have been a matter of design choice. A skilled artisan would expect the device to function properly whether parallel lines or intersecting lines, such a mesh, are used for the cathode.

With respect to claims 4-6 and 15-17, Suzuri et al does not specifically teach the total surface area of its elongated members (27) with respect to the total surface area of said layer (26). However, Suzuri et al is not limited to any particular length and width for its members (27). The use of a length and width of the members (27) such that the members (27) have a surface area that is less than 50%, or less than 25%, or less than 10% of the surface area of the layer (26) would have been within the level of ordinary skill in the art so as to prepare a working organic EL element.

With respect to claims 7 and 18, when an area of short circuit is present in said layer (26), it is the Examiner's position that an area surrounding a point of the short circuit is capable of being ablated by heat generated by the short circuit because Suzuri et al's compound electrodes have the same structure as the instant compound electrode.

With respect to claims 23-25 and 27, Suzuri et al, as noted above, teaches that the layer (26) has a thickness of, for example 0.5 nm, whereas the plurality of elongated members (27) each has a thickness of 200 nm (see col. 30, lines 60-66). The layer (26) can, in general, have a thickness of 0.1 to 100 nm (see col. 8, lines 63-65). Suzuri et al does not specifically require that said layer (26) has a thickness of about 1 to about 25 nm as in said claims 23-25 and 27. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared Suzuri et al's organic EL element such that the layer (26) has a thickness with the range of about 1 to about 25 nm because Suzuri et al exemplifies a thickness of 0.5 nm and teaches, in general, that the thickness can be from 0.1 to 100 nm.

With respect to claim 37, Suzuri et al does not specifically require a plurality of its organic EL elements disposed on a support. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have prepared a device with a plurality of Suzuri et al's organic EL elements on a support so that a desired pattern or display could be obtained.

Response to Arguments

18. Applicant's arguments filed April 10 2006 have been fully considered but they are not persuasive. Applicant argues the amendments to the claims overcome the prior art as the prior art does not disclose the claimed composition. The examiner respectfully disagrees. As stated above, the examiner interprets the amended claims to allow for extra elements along with a choice from the Markush group within the claims. The prior art contains these elements along with oxides, fluorides or other halides and therefore meets this interpretation of the claims. The examiner also stated above an alternate interpretation of the claims which does not allow any other element in the layer except those in the Markush group. The examiner has shown how it would be obvious to place such a layer within the prior art in the rejections above. Therefore it is the position of the examiner that the prior art does teach the claimed composition as described in the rejections above.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

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Anthony Fick AOF
AU 1753
October 31, 2006